MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

BDM2384 – DATABASE MANAGEMENT SYSTEMS

(All sections / Groups)

17 OCTOBER 2016
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 5 pages (including cover page) with 4 questions only.
2. Attempt ALL FOUR questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answer in the Answer Booklet provided.

Question 1 (25 Marks)

1. Given below are the stages in the system development life cycle. Explain how database development is aligned with these methodologies. (5 x 3 =15 Marks)
    a. Planning
    b. Analysis
    c. Design
    d. Implementation
    e. Maintenance

2. Data from driver's license bureau maintains a database of licensed drivers. State whether each of the following represents data or metadata. If it represents data, state whether it is structured or unstructured. (7 Marks)

    a. Driver's name, address, and birthdate
    b. The fact that the driver's name is a 30-character field
    c. A photo image of the driver
    d. An image of the driver's fingerprint
    e. The make and serial number of the scanning device that was used to scan the fingerprint
    f. The resolution (in megapixels) of the camera that was used to photograph the driver
    g. The fact that the driver's birth date must precede today's date by at least 16 years

3. Write three disadvantages of file processing systems (3 Marks)

Question 2 (25 Marks)

For each of the descriptions below, express the relationships and cardinalities graphically with an E-R diagram.

1. A book is identified by its ISBN, and it has a title, a price, and a date of publication. It is published by a publisher, each of which has its own ID number and a name. Each book has exactly one publisher, but one publisher typically publishes multiple books over time. A book is written by one or multiple authors. Each author is identified by an author number and has a name and date of birth. Each author has either one or multiple books; in addition, occasionally data are needed also regarding prospective authors who have not yet published any books. It is important to record the percentage of the royalties that belong to a specific author, whether or not a specific author is a lead author of the book, and each author's position in the sequence of the book's authors. (12 Marks)

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2. A vendor builds multiple types of tablet computers. Each type has a type identification number and a name. The key specifications for each type include amount of storage space and display type. The company uses multiple processor types, exactly one of which is used for a specific tablet computer type; obviously, the same processor can be used in multiple types of tablets. Each processor has a manufacturer and a manufacturer's unique code that identifies it. Each individual tablet computer manufactured by the vendor is identified by the type identification number and a serial number that is unique within the type identification. The vendor wants to maintain information about when each tablet is shipped to a customer. Each of the tablet computer types has a specific operating system. Each technician the company employs is certified to assemble a specific tablet type – operating system combination. The validity of a certification starts on the day the employee passes a certification examination for the combination, and the certification is valid for a specific period of time that varies depending on tablet type – operating system combination. (13 Marks)

Question 3 (25 Marks)

Below is a set of tables for the Art Course database. You are required to answer the questions below based on these tables.

CUSTOMER (CustomerNumber, CustomerLastName, CustomerFirstName,Phone)

COURSE (CourseNumber, Course, CourseDate, Fee)

ENROLLMENT (CustomerNumber, CourseNumber, AmountPaid)

where

CustomerNumber in ENROLLMENT must exist in CustomerNumber in

CUSTOMER

CourseNumber in ENROLLMENT must exist in CourseNumber in COURSE

CustomerNumber and CourseNumber will never be modified, and there is no need for cascading updates. No customer data is ever deleted so there is no need to cascade deletions. Courses can be deleted, and if there are enrollment entries for that class, they should also be deleted.

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1. Write the SQL statements necessary to create the three tables and their referential integrity constraints. (15 Marks)

2. Write SQL statements to insert the first *two* data for all three tables (3 Marks)

	CustomerNumber	CustomerLastName	CustomerFirstName	Phone
1	1	Johnson	Ariel	206-567-1234
2	2	Green	Robin	425-678-8765
3	3	Jackson	Charles	306-789-3456
4	4	Pearson	Jeffery	206-567-2345
5	5	Sears	Miguel	360-789-4567
6	6	Kyle	Leah	425-678-7654
7	7	Myers	Lynda	360-789-5678

	CourseNumber	Course	CourseDate	Fee
1	1	Adv Pastels	2009-10-01 ...	500.00
2	2	Beg Oils	2009-09-15 ...	350.00
3	3	Int Pastels	2009-03-15 ...	350.00
4	4	Beg Oils	2009-10-15 ...	350.00
5	5	Adv Pastels	2009-11-15 ...	500.00

	CustomerNumber	CourseNumber	AmountPaid
1	1	1	250.00
2	1	3	350.00
3	2	2	350.00
4	3	1	500.00
5	4	1	500.00
6	5	2	350.00
7	6	5	250.00
8	7	4	0.00

3. Write a SQL query to list all occurrences of Adv. Pastels course. The expected output table is given below. (2 Marks)

	CourseNumber	Course	CourseDate	Fee
1	1	Adv Pastels	2011-10-01 ...	500.00
2	5	Adv Pastels	2011-11-15 ...	500.00

Continued...

4. Write a SQL query to list all students registered in the Adv. Pastels starting on October 1, 2011. Include, in this order, the CustomerLastName, CustomerFirstName, CourseDate, Fee, CustomerName, and Phone. The expected output table is given below. (5 Marks)

	Course	CourseDate	Fee	CustomerLastName	CustomerFirstName	Phone
1	Adv Pastels	2011-10-01 ...	500.00	Johnson	Ariel	206-567-1234
2	Adv Pastels	2011-10-01 ...	500.00	Jackson	Charles	306-789-3456
3	Adv Pastels	2011-10-01 ...	500.00	Pearson	Jeffery	206-567-2345

Question 4 (25 Marks)

1. What problems in operational data create the need to clean data before loading the data into a data warehouse? (5 Marks)

2. Why are data warehouses necessary? Explain the structure of a data warehouse. (10 Marks)

3. Explain the difference between a data warehouse and a data mart. Give an example. (2 Marks)

4. Briefly explain what business conditions that encourage using distributed databases. (8 Marks)

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